**Chapter 10: Threats to Internal and External Validity**

**Overview**

Experimental designs should be developed to ensure internal and external validity. Are the results of the study caused by factors included in the study or are they caused by other factors which weren’t part of the hypothesis?

**Internal Validity:** The degree to which the results of a study can be attributed to the treatments or other independent variables identified in the hypothesis. **Extraneous Factors**: Nuisance variables or design elements that confuse relationships among the variables being studied. Any possibility that findings may be due to extraneous factors reduce internal validity.

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| **Threats to Internal Validity** | |
| **History:** Impact of events unrelated to the study that happened to take place during the study | **Instrumentation effects:** Effects on scores due to differences in the conditions of testing. |
| **Maturation:** Effects on study subjects due to the passage of time | **Selection bias**: Differences between groups due to different processes of selection into the groups. |
| **Testing effects:** Effects of taking a test or questionnaire on later behavior | **Statistical regression**: The tendency of extreme scores to regress toward the mean on other measures. |
| **Ceiling effects**: A characteristic of a distribution of scores in which many scores are near the maximum possible value. | **Mortality**(attrition): Loss of subjects over the course of a study |
| **Floor effects**: A characteristic of a distribution in which many scores are near the minimum possible value. | **Teacher effects**: Effects on students having a particular teacher |
| **School effects:** Effects on students of attending a particular school | **Class effects**: Effects on students of being in a particular class |

**External Validity:** The degree to which the findings of a particular study have meaning for other settings and samples. Need internal validity to have external validity.

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| **Threats to External Validity** | |
| **Lack of internal validity:** The condition that research has not established the finding in the first place | **Reactivity:** The tendency of observation or experimentation to change the phenomenon being studied. |
| **Nonrepresentativeness:** The condition that study findings are from a setting or population unlike the one to which a researcher wishes to generalize. | **Hawthorne effect:** A tendency of subjects in an experiment to exert outstanding efforts because they know they are in an experiment. |
| **Artificiality:** The condition that findings of small, brief, or contrived studies may not apply to realistic settings. | **John Henry effect:** A tendency of subjects in a control group to exert outstanding efforts because they know that they are in an experiment and don’t want to come out worse than the experimental group. |